Ohio Nutrient Forum Workshop

Nutrient Removal Program Examples, Related Regulatory Actions & Funding

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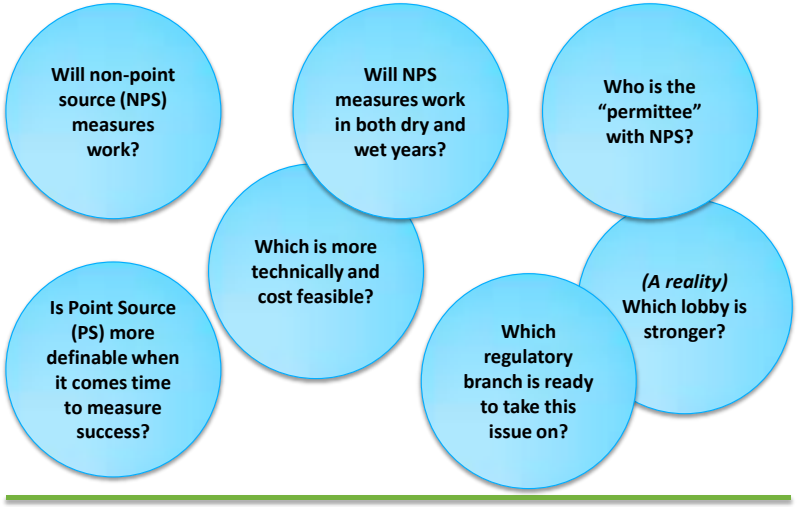
Voluntary vs. Involuntary?

- **Carrot**
  - Lower-interest or longer-term loans, grants
  - No federal assistance?
- **Stick**
  - NPDES, TMDL, Gulf Hypoxia / EPA Action
- **Controls**
  - Preliminary engineering technical and financial review
  - Loan and/or grant program policies and procedures
  - Grant eligibility determination
  - Voluntary tied to two-party agreement
  - Involuntary (and voluntary?) tied to NPDES Permit

Point Source vs. Non-Point Source



Cost Feasibility

- **Priorities** for financial assistance?
- At first, **financial incentives** for readiness-to-proceed?
- Then, **financial controls** monitoring cost-effectiveness?
- **Affordability**? Benchmark sewer rates? Use HMI measure?
- Technology **grant eligibilities** times local-share eligibility equals what cents-on-the-dollar range and average for State funding?
- **What funds** the Grant Program?
- **How** are grant monies distributed?
- Then other subtleties such as… financial incentives for different levels of treatment?

EXAMPLE PROGRAMS

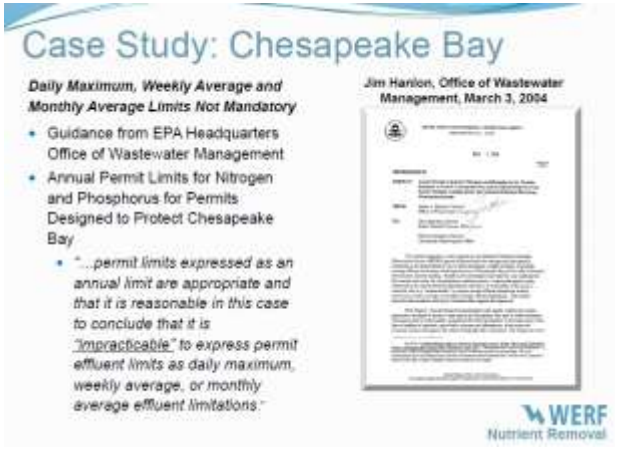
Things To Think About When You Think of Nutrient Removal

Gulf of Mexico Hypoxia & Pending Nutrient Removal Program

- Point Source Nutrient Removal (NR) Levels, "Likely Effluent Limits"?
  - Biological NR – 8 mg/L TN, 1 mg/L TP
  - Advanced NR – 5 TN, 0.5 TP
  - Enhanced NR – 3 TN, 0.1-0.3 TP
- Non-Point Source controls, BMPs, offsets, credits
- 2013 TMDL?
- Pending Far-Field impacts on Ohio?

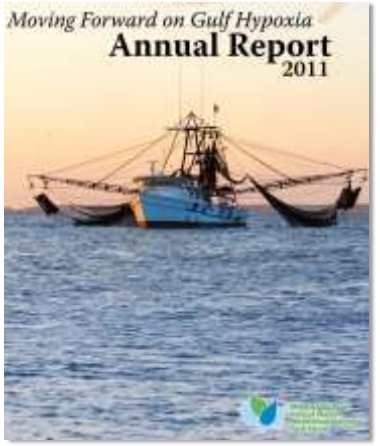
Gulf Hypoxia Program may look a lot like Chesapeake Bay's

- Much of the basis, the 30-year-old Chesapeake Bay Program



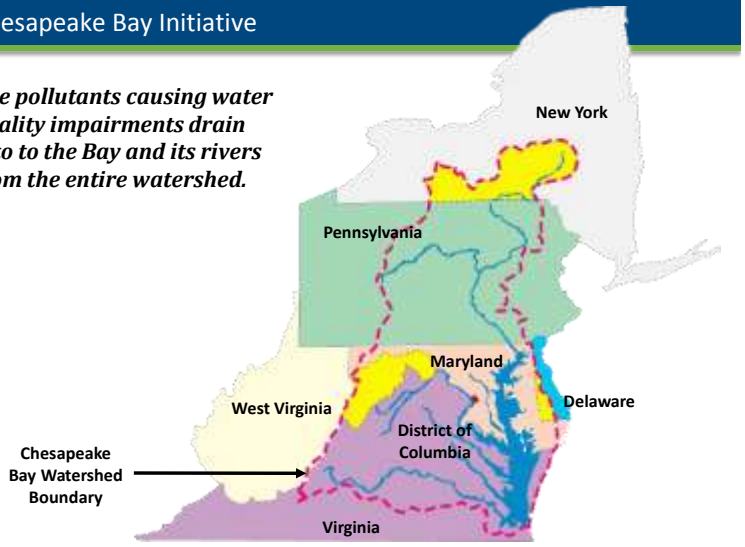
FY 2011 Operating Plan…

- Planning, documentation, working towards 2013 program update



Chesapeake Bay Initiative

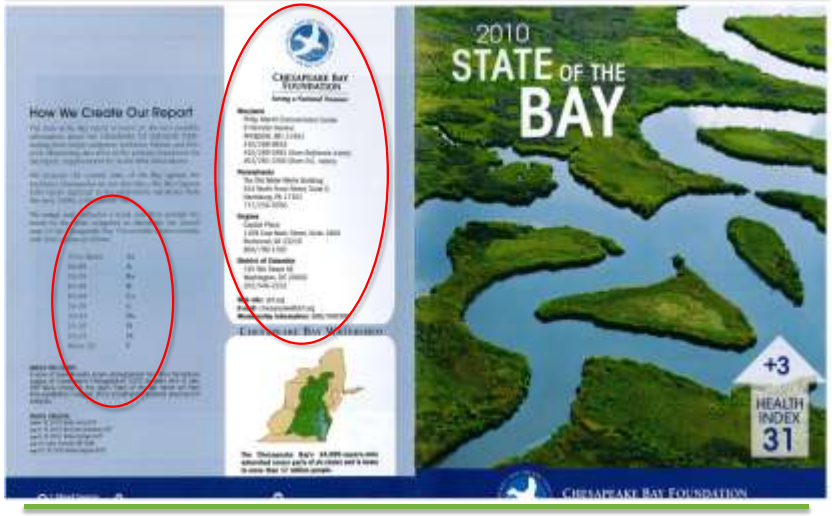
The pollutants causing water quality impairments drain into to the Bay and its rivers from the entire watershed.



Sources of Nutrients

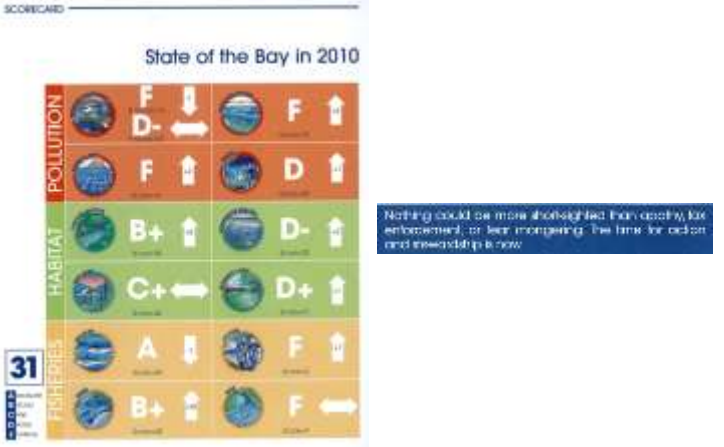
- **WHAT, WHERE, WHY**
  - Public education program

Chesapeake Bay Program – applicable to Ohio, or Gulf Initiative?



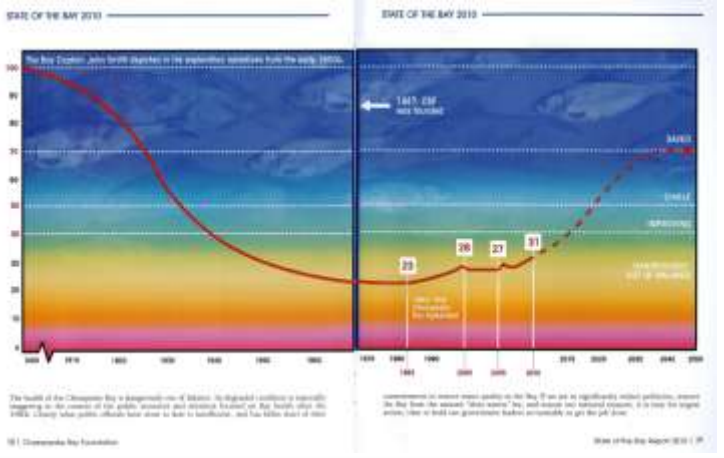
Chesapeake Bay Program – applicable to Ohio, or Gulf Initiative?

- A 30-year-old Chesapeake Bay Program



Chesapeake Bay Program – applicable to Ohio, or Gulf Initiative?

- For the public, calibrating to the 1600s



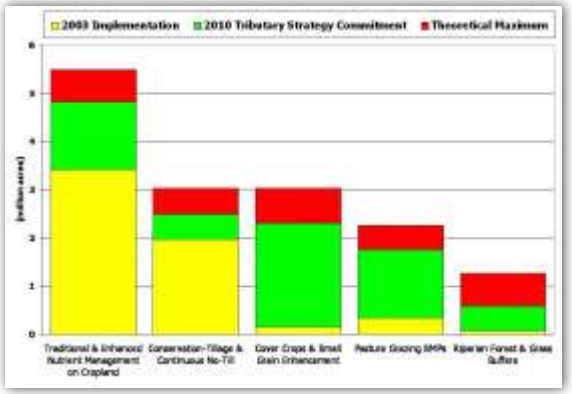
Source of Nutrients

- **WHO, WHAT, WHERE**
  - Cap Load allocations by state *(changed with 2010 Bay TMDL …)*

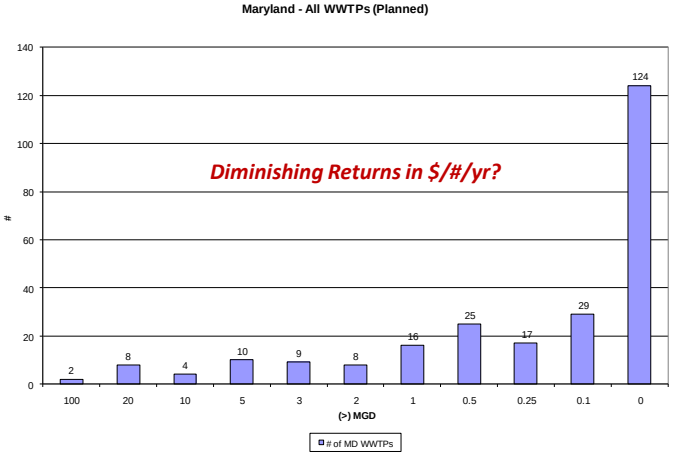
State	Nitrogen Allocation (million lbs./yr.)	Phosphorus Allocation (million lbs./yr.)
Pennsylvania	72	2.3
Maryland	37	2.9
Virginia	51	6.0
District of Columbia	2	0.3
New York	13	0.6
Delaware	3	0.3
West Virginia	5	0.4
Subtotal	183	12.8
Clear Skies Reduction	-8	
Basin-Wide Total	175	12.8

Nutrients – Maryland

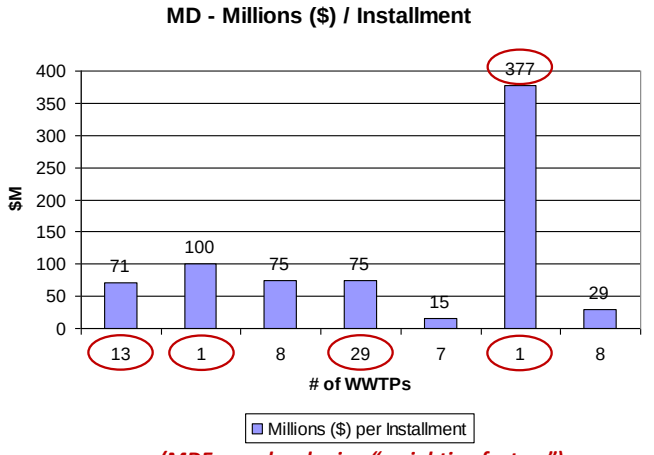
- **WHO, WHAT, WHERE**
  - Load reductions – Maryland example



Nutrients – Maryland



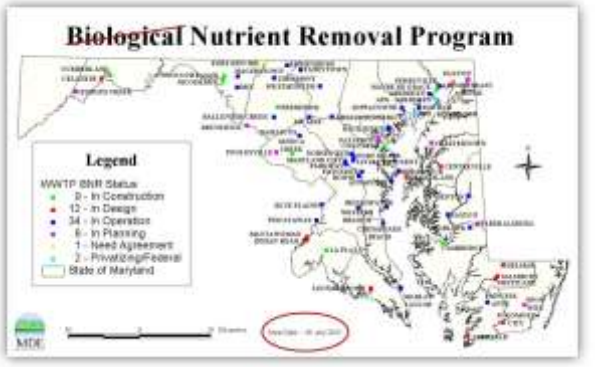
Nutrients – Maryland



(MDE was developing "weighting factors")

Nutrients – Maryland

- **WHO, WHAT, WHERE**
  - Load reductions – Maryland example
    - 206 and growing, 68 "major"

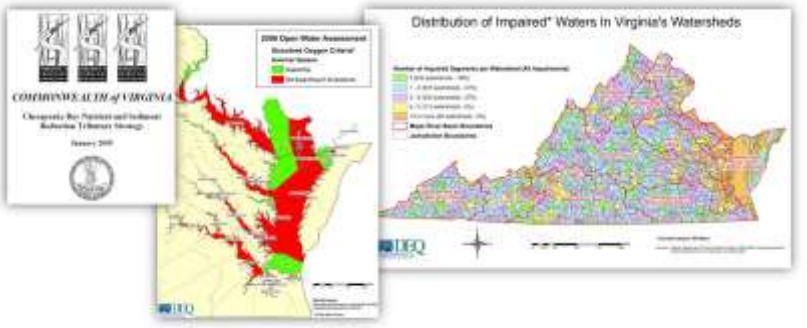


Nutrients – Maryland

- **WHO, WHAT, WHERE**
  - Point sources first, again
    - BNR to ENR, some secondary to ENR
  - TN 3, TP 0.3 - everywhere
  - State loan program, State grant program
    - Fund for plants
    - Fund for septics and agriculture
    - Funding for State administration
    - Certain earmarks
  - Flush tax (initial $2.50/month/EDU) – everyone
    - Sewer users, septics, other "equivalents"
    - Doubled in 2012

Nutrients – Virginia

- **WHO, WHAT, WHERE**
  - Load reductions – Virginia example
    - 1990s scrapped the car tax and BNR, no flush tax
    - Growing, 125 "significant" (not EEE), catching up

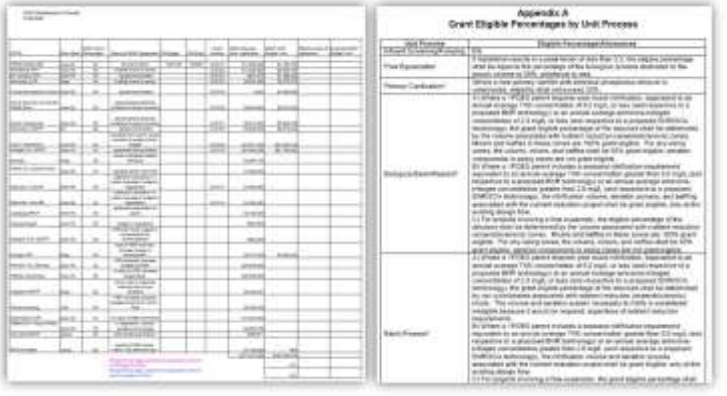


Nutrients – Virginia

- **WHO, WHAT, WHERE**
  - Waste load allocations, "footnotes" (the race was on)

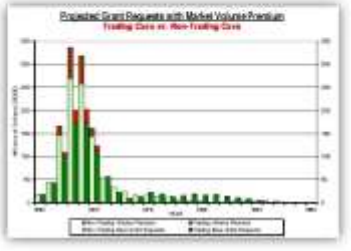
Nutrients – Virginia

- **WHAT, HOW**
  - Rules of the game – readiness, eligibility



Nutrients – Virginia

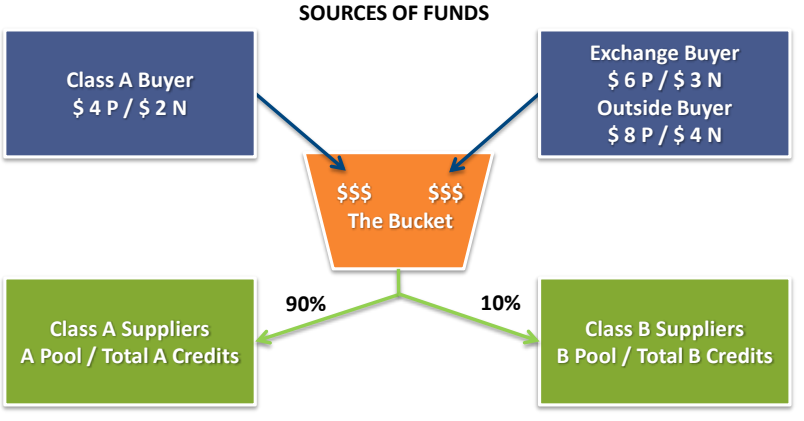
- **WHO, WHAT, WHERE**
  - Load caps and trading – Virginia example



Upgrade projects generally are retrofits, some with expansion, in the range of 50-80% "eligible", with grants around $0.15 to $0.35 on the dollar.

VNCEA Trading

- Legislature -> General Permit -> Cash Flow and "The Bucket"



VNCEA Trading

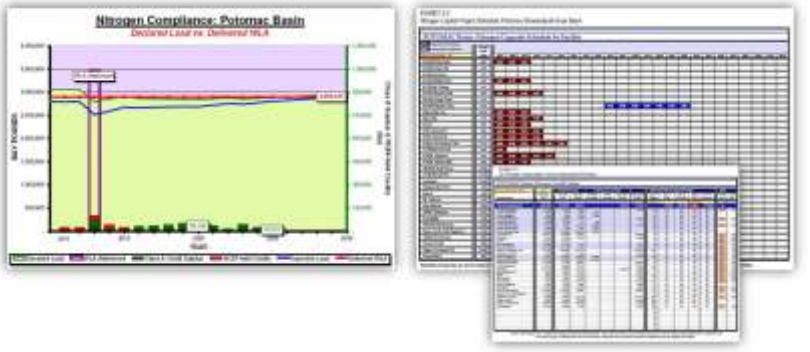
- Base case, credits, shortfalls

Credits Generated and Demanded, lbs.					
Facility	All Credits	Class A		Class B	
		Supply	Demand	Supply	Demand
P-1	68,492	30,000		38,492	
P-2	34,246	20,000		14,246	
P-3	-13,698		-16,000	2,302	
P-4	-15,023		-12,000		-3,023
P-5	-4,566		-8,000	3,434	
Total		**50,000**	**-36,000**	**58,474**	**-3,023**

Compliance Plan Positions (Class A)			
Facility	Design Flow, MGD	Supply	Demand
P-1	Upgrade to 6 mg/L	30,000	
P-2	Upgrade to 6 mg/L	20,000	
P-3	Upgrade to 6 mg/L	8,000	
P-4	No upgrade		-12,000
P-5	No upgrade		-8,000
Total		58,000	-20,000
Net Credits		**38,000**	

Nutrients – Virginia

- **WHAT, HOW**
  - VNCEA participant, non-participant
  - Individual Permit, General Permit, exchange



Nutrients – Pennsylvania

- **WHAT, HOW**
  - Initial "Growing Greener" grants for non-point
  - Behind the curve (MD, VA, 2010 TMDL)
  - First point source "top-20" and beyond, then "21-100"
  - Experimenting with NPS-to-PS trading
  - Tributary strategy ...

Nutrients – Pennsylvania

- **WHAT, HOW**
  - DEP Chesapeake Bay Steering Committee
  - Work with MD (Susquehanna River)
  - Point source work group
  - Implementation for sewage facilities planning
  - Implementation for NPDES permitting
    - Cap at Design Q
    - Cap Ex. at 6 TN, 0.8 TP
    - Phase in with NPDES
    - Able to trade or offset
  - 2010 TMDL vs. PA plan
  - Sediment and dams?

PROGRAM COSTS, REGULATIONS

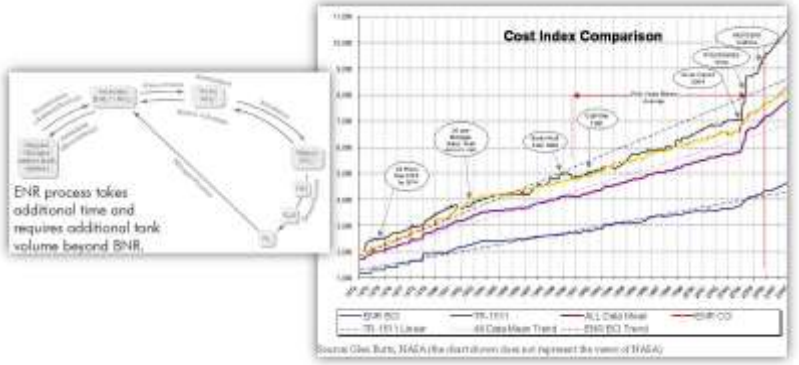
History Has Taught Us Some Lessons

Construction Market Conditions

- Estimate, complications, recalibrate

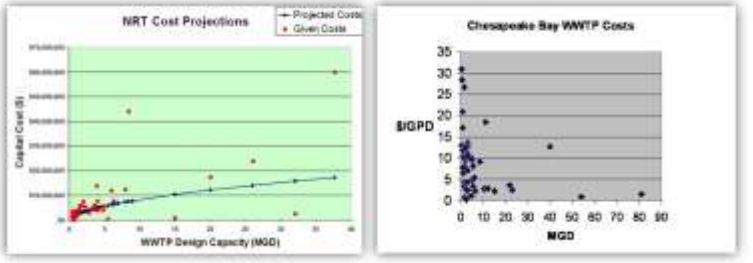
Construction Market Conditions

- Timing is everything
  - MD was underway, VA surprised, PA starting up in a downturn...



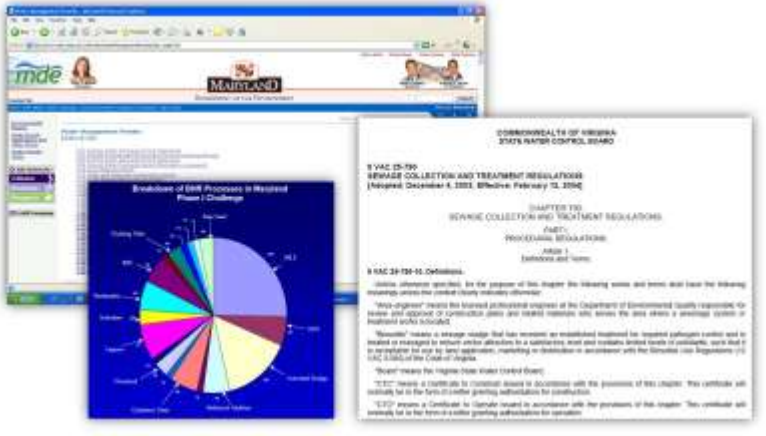
Construction Market Conditions

- Estimate, complications, recalibrate
  - Before, after



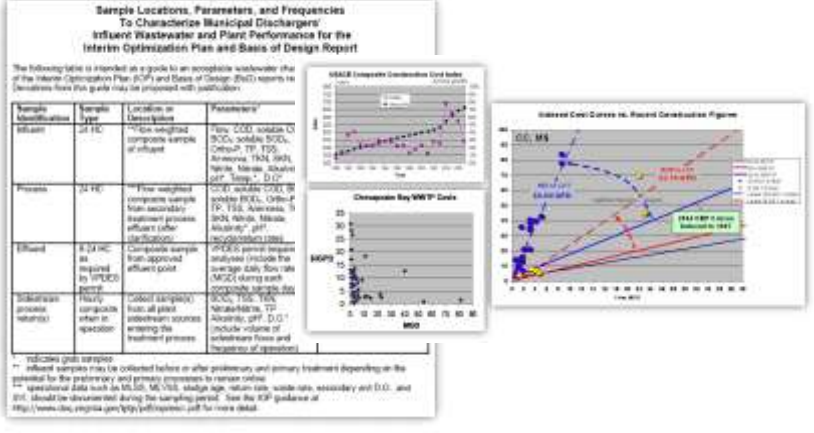
Technology and Regulations

- Behind the times and requirements



Technology and Regulations

- Influent / effluent characterization, standardize



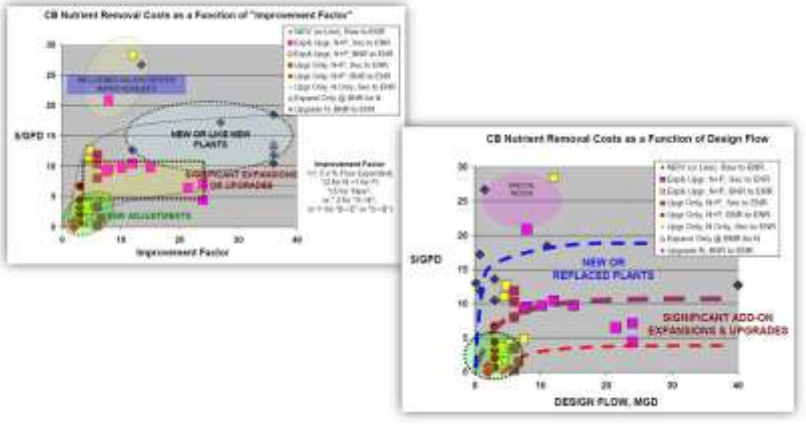
Technology and Regulations

- Grant agreements, permits, trading commitments

VIRGINIA WATER QUALITY IMPROVEMENT FUND
POINT SOURCE GRANT AND
OPERATION AND MAINTENANCE AGREEMENT

Everything, Everywhere, Everyone?

- Gulf of Mexico Initiative



Some information from the OEPA Workgroup

- According to EPA ECHO data – Ohio (2010)
  - 94 "Majors" with TP limits
  - 161 Majors with Nitrogen limits (vast majority Ammonia-N?)
  - 201 Majors (accurate? others?)
    - The OEPA list – 230 if 1-MGD rating cutoff, 326 if 0.5, 363 if 0.4
      - Ex's , Significant Dischargers (N,P) – MD 68, VA 125, PA 165

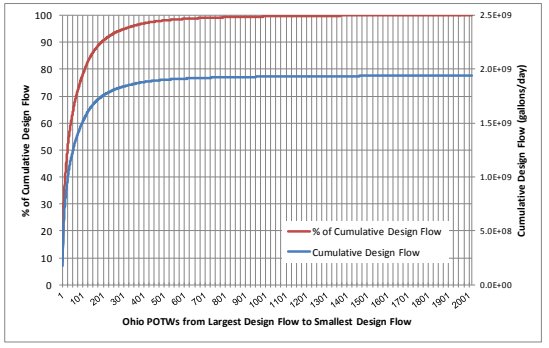
- NR Challenges
  - Nutrient Removal may becoming THE controlling factor
  - Large vs. small POTWs – technologies
  - CSO or Wet Weather Management challenges
  - Other local water quality limits may be drivers
  - Industrial Sewer Use Regulations and surcharges for N or P?

Key Issues in Your Region

- Midwest states are headwater states
  - Local WQ may dictate, Gulf delivery factor is your friend
  - POTW vs. Indirect discharge? Majors vs. all?
- Understanding the science
  - Gulf model, local TMDLs, NR processes
- Shaping a regulatory program
  - Timing, politics, administration, targets, and phasing
  - Burn both ends of the candle? (Gulf, local TMDLs) (& SSO/CSO)
- Political decisions by state
  - Share of reduction and when, where, why, how
- NR will require updating aging infrastructure ($$$)
- Decisions regarding financing a program (incentives, control)
  - Loan, grant, local, tax(?), distribution

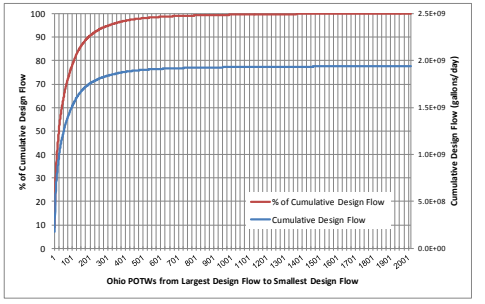
Ohio POTWs – Statistics

- Point of Diminishing Returns?
  - In achieving further TP removal, given Great Lakes Initiative?
  - Based on Plant Size?
  - Different for Ohio River vs. Lake Erie? TP, TP + TN, TN, TN + TP?

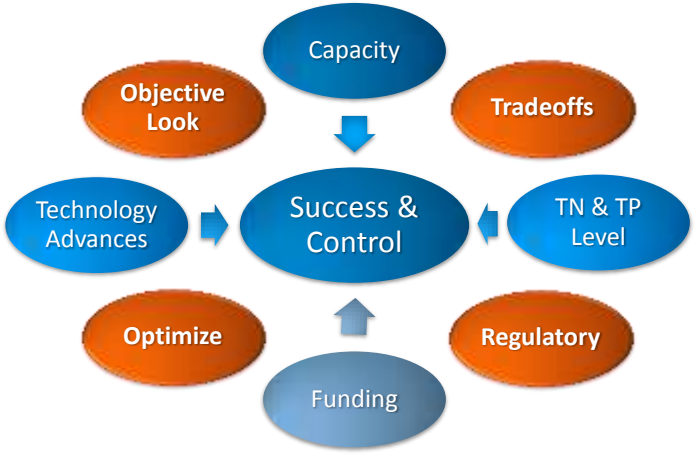


Ohio POTWs – Potential?

- Largest 100 POTWs (cutoff around 4-MGD rating)
  - 1,513 MGD Design Flow
    - Actual % of Design? Expected increase in next 5, 10, 20 years?
  - 1 mg/L TP removal avg at all 100 POTWs is 3.45 M #/yr, if at 75%
  - 8 mg/L TN removal avg at all 100 POTWs is 27.6 M #/yr, if at 75%



Program Issues



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QUESTIONS?

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THANK YOU

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